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THE FUNCTION AND SCOPE OF SOCIAL PHILOSOPHY

I

MODERN philosophy in its regnant aspect is, for all its pride of universality, an exceedingly one-sided affair. It is essentially the outcome of the remarkable nineteenth-century development of the mathematical, physical, and biological sciences. Its "philosophical" function has consisted in subjecting the concepts employed by these sciences to an inspection more penetrating than could be given by the workers in the special fields. Thus where the physicist swiftly marshaled atoms and electrons, energies and matters, spaces and motions without critical thought of their wider implications, the philosopher, free of the stress of immediate experimental necessity, examined these concepts for the more far-reaching meaning which they held. For several generations now philosophy has concerned itself almost wholly with such concepts as cause, action, matter, mind, truth, mechanism, organism, number, class, infinity, objective, subjective. One need not doubt the true philosophical character of such concern; yet one may not escape the conviction that in restricting itself to these interests philosophy has fallen short of its adequate task. Indeed, among philosophers themselves there has been manifest of late the feeling that philosophy has lost much of its proper reach and power, that it has relinquished in somewhat woeful manner its ancient prerogative of "spectator of all time and all existence."

Yet it would be unfair to blame philosophy or philosophers for this restriction of the scope of inquiry. Philosophy, like every other human enterprise, is, in main degree, the product of its time. Nay, more, if it is to be true to its scientific spirit, if it is to make no proud effort to build itself out of its own imaginings, but is to hold itself to the task of faithful, searching criticism of the dominant concepts of its day, philosophy may never depart very far from the spirit and interest of its particular age. Contemporary philosophy, in short, has, without blame to itself, been one-sided because the scientific age just closing was itself one-sided. The natural and the mathematical

sciences were all-important. The social sciences were scarcely in evidence.

The present, however, already wears a different aspect. Science to-day shows widely and powerfully the effect of a generation and more of intense and growing social concern. The change to a new type of economy, the vast and intricate expansion of industrial and business methods, the growth of new types of congregate life, the application of the telegraph and the telephone, the development of newspapers, the linking of cities and nations by steamship and rail, the swift readjustments of economic wealth, the marshaling of men into new tasks and new relations,—all these have brought problems stimulating in their immensity. The result has been a new and wholly unprecedented grappling of thought with social issues. The science of economics, for example, possesses a magnitude and intricacy such as it has never had before. Sociology is wholly a child of our own day, still unformed, to be sure, and even yet scarce witting of its way, but vital with possibilities and quenchless with enthusiasm. Social biology, social psychology, social medicine, the science of charity, political science, jurisprudence, the psychology of religion, social ethics, social statistics, ethnology, ethnography, demography,—all of these, in the vigor of their promise, are really products of our own day.

It needs no prophet's eye, then, to see that for philosophy a new direction is imminent. As philosophy enters upon this new way, the same type of circumstances which gave it its task during the period of the mathematical-natural sciences will give it its task in the period of the social sciences. Each social science will employ its characteristic concepts. Philosophy must be the comprehensive critic of these.

To make this position clear let us take an example from economics. To most persons economics is the science which holds the more or less decisive word as to the organization of the processes of production and distribution. It is assumed that economics knows, or aims to know, the conditions under which things ought to be produced and the manner in which such products ought to be distributed. This assumption has given to the science of economics a commanding position in our social and business life, a position indicated by the fact that if a theory of social reform is condemned by the greater body of economists, there is in this very fact, for most scientific-minded persons, reason for its rejection. Such power of social authority, however, may not be lightly granted any science save upon the assurance that its concepts and methods are adequate to its commanding pretensions. Economics, therefore, invites inspection as to its fundamental point of view and procedure.

Let us examine a recent definition of economics.[1] "Economics, or

[1] Seager, H. R., "Principles of Economics," page 1.

political economy, is the social science which treats of that portion of human activity which is concerned with earning a living." An ambiguity at once discloses itself. Does "earning a living" mean earning a reputable living, a living worth while to the individual and to society; or does it mean earning any kind of living, performing any kind of work or service that keeps one alive? Evidently, if it means the former, economics must be a fundamentally evaluating science, determining what ways of life are "good" ways and what are "bad." It must, in short, make use of ethical categories and conclusions. The writer continues: "It deals, on the one hand, with man's wants and, on the other, with the goods (*i. e.,* the commodities and services) upon which the gratification of his wants depends." Again an ambiguity discloses itself,—two, in fact. Does "goods" mean "good things," things *good* for a man, or has the word the neutral meaning which it assumes in such a word as "dry-goods"? Again, in dealing with man's "wants," is economics dealing with his fundamental wants, *i. e.,* his needs, or with anything he wants, irrespective of whether it is worth his while or "good" for him to want these things? Obviously, if the science of economics holds to the former of these two pairs of meanings—goods in the neutral sense and wants meaning any desires whatever—it can not serve as a sure guide for determining how and what we *ought* to produce and how and what wants ought to be satisfied.

The issue, therefore, is crucial. Either economics is a non-evaluating science, in which case it should not hold the peculiarly commanding position of social guidance which apparently it does; or it is an evaluating science, in which case any avowed separation on its part from the ethical sciences is wholly without point or justification. The writer above quoted is not long in taking his stand on this issue. On a succeeding page of his book (p. 52) he writes: "The material commodities and personal services which are objects of human desire are conveniently designated as *goods,* while the capacity or quality in goods which makes them desirable is called *utility.* As used in economics these terms are stripped of the moral implications that sometimes attach to them in ordinary speech. Thus, *anything that is an object of desire has utility and is a good,*[2] whether it be the hymn-book of the missionary or the whiskey of the trader. This usage is designed to give greater precision to discussions involving these concepts and also to avoid the mistake of substituting the approval or condemnation of the actions of business men for the explanation of their action—the primary task of economics."

Economics, in short, if this writer is correct, *has nothing whatever to do* with the question what *ought* to be the organization of our

[2] Italics mine.

processes of production, distribution, and consumption. *It is a science wholly descriptive (explanatory) of actual processes.* If this is true, then obviously the economist goes outside his province when, without a modification of his own purely descriptive attitude, he criticizes the social ethicist. The latter points to what he believes to be a more adequate type of business organization. Upon the question of value here involved the economist and the social ethicist have no secure meeting-ground. For the one, everything that satisfies a desire has utility, is a "good"; for the other, only those things or services that satisfy desires which ought to be satisfied have utility, are "goods"; all others are disutilities, "bads." The difference in point of view is crucial. What makes for a perfectly successful economic organization under the one meaning may, under the other, make for fundamental individual and social failure.[3]

I take this as a typical illustration of the situation with which the social philosopher is confronted. Obviously, in the cases cited, the concepts "earning a living," "goods," "utility" are used in a carefully restricted sense (or broad sense, as the reader may view it) which makes them unavailable for precise human valuation. Economics, as we have remarked, seems, however, to have served as an evaluating authority, and this not only to the laymen who read, but to many of the experts who write the conclusions. Hence the need for a broader and more critical inspection of the point of view and function of this science. What, for example, does the science mean by such a fundamental concept as "wealth"? Does wealth mean

[3] *Cf.* Nicholson, "Principles of Political Economy," page 14: "In my opinion one of the greatest merits of the old English school is the sharp distinction drawn between economic laws and moral ideals. Political economy on this view classifies and explains certain social facts, and discovers their laws and relations, just as the natural sciences deal with phenomena of a different order. Thus, starting with private property and freedom of competition as existing facts, we may discover certain laws of rent, profits, and wages; but whether this distribution of the nation's wealth is morally just or unjust is relegated, together with the question wherein justice consists, to ethics." *Cf.*, too, the different point of view of Cunningham, in "Politics and Economics," page 12: "Economic science is wholly practical, it has no *raison d'être* except as directing conduct towards a given end: it studies the means leading towards that end not merely for the sake of knowledge, but in the hope of guiding men so that they may pursue that end in the most appropriate way: it is not content to describe the principles that have actuated human conduct, but desires to look at these principles in the light of after events, and thus to put forward the means that are best adapted for attaining the end in view." *Cf.*, too, the ambiguous statement of Hewins, in "Encyclopedia Brittanica," 11th ed., art. *Economics:* "Economics . . . includes the discussion of all the numerous factors which make life profitable, whether to the nation or to the business, or to the individual man. It may be conceived either as an historical science (What principles have in fact paid?), or as an abstract science (What are the true principles which must pay, presupposing an ideal?)."

weal-th, or does it mean simply the sum of "goods," as above described?[4] Has wealth reference simply to the quantity of goods produced, or also to the manner of their distribution? Has it, more broadly and deeply, reference also to the manner of their consumption? What are business "efficiency," industrial "efficiency"? Has the first reference to the power to accumulate surplus, the second to the power to produce goods? Or have both a broader meaning? What is meant by a "living" wage, by industrial "health," industrial "progress," industrial "stimulus"? What is "good business"? What, in deeper fact, is "saving"? What are the real "costs" of business and industry?

Here is a wealth of concepts which needs critical inspection. It is not unfair to say that even by economists they are still used with vague and shifting meanings. The case is analogous to the unprecise use of such terms as matter, energy, cause, etc., by the physical scientists. Social philosophy, therefore, in relation to economics has its task clearly defined: it is to examine, first, the intended scope of the concepts employed; second, it is to determine whether or not in the actual elaboration of these concepts the science passes imperceptibly beyond the intended use; and, third, it is to determine what relation the special meanings assigned bear to the meanings which these concepts yield when they are regarded from a point of view that is thoroughly comprehensive.

The third is, of course, the peculiarly distinctive task of social philosophy. The aim of the social philosopher is to get a *whole* view of social life. Economics at its best can not yield such a whole view; nor can political science, nor jurisprudence, nor social psychology, nor social medicine. Each of these is obviously and avowedly restricted in outlook. Each in a sense is disorganic. Political science, for example, treats of government; but its interest is in only one type of government, the kind that operates through votes and legislatures, judges and executives. Its conception of citizenship is then framed in view of this restricted interest, so that citizenship comes to mean, in this science, a certain relation which persons bear to votes and legislatures, judges and executives. But, as a matter of fact, social government passes widely beyond these. The biologist in his laboratory, the chemist at his retorts, the research physician, the practising physician, the teacher of social or physical or mathematical truth, the director of newspaper policies, the organizer of business, the controller of credit, the bearer and rearer of children,—all these

[4] *Cf.* Marshall, "Economics of Industry," pages 51–53: "All wealth consists of things that satisfy wants, directly or indirectly. . . . It includes all those things, external to a man which (i) belong to him, and do not equally belong to his neighbors, and therefore are distinctly his; and (ii) which are directly capable of a money measure."

are social governors. Government, in short, exists wherever there is power to organize and direct life destinies. Preeminently the *truth finders* and the *truth appliers* are the *government*. But if this is so, citizenship takes on a far wider meaning, being related now not simply to the secondary functions of voting and legislating, but to the primary functions of truth discovery and application.

Yet it would be folly to ask of political science that it take this broader view of government and citizenship. Its special task is to study *political* government, a task which is a wholly possible and valuable one. Mischief arises only when, by the reader of political science, or sometimes by the scientist himself, the special task is not recognized as special; when government and citizenship, for example, are supposed to have their final and most comprehensive meaning discovered by this avowedly restricted science. That the mischief is not imaginary is shown by the misconceptions that are rife in the contemporary discussion whether women shall participate in the government of society. When the essence of government is held to reside in purely political acts and relations, the granting of a vote means a momentous change from non-participation to participation in social government. When, however, more broadly, it is held to reside in all those activities that organize and direct life activities, the granting of a vote is seen but to complete and clarify a participation long since a fact. Again, the mischief discloses itself in the teaching of so-called "civics" to our children. "Civics," as taught, consists very largely in an analysis of the structure and functions of *political* government. Good citizenship, therefore, comes preeminently to mean good voting. Thus a serious divorce is made between civic life on the one hand and business or scientific or literary or domestic life on the other.

The task of the social philosopher, in all these matters, is to find the broader, the organic view. The same situation is exemplified in law. It is a notorious fact, particularly in America, that something very mysterious and distressing has happened to the concept of justice. Our high judicial experts are men of probity and sincerity; our law is a carefully elaborated system reaching far back into human history; our procedure is conducted with intricate and painstaking attention; and yet justice somehow makes but a sorry showing in the hands of our scientific legalists. The same typical difficulty confronts us here. Justice, from the legalist's point of view, is, very often, not justice at all. Why? Precisely because it is understood from the legalists' point of view. An analysis of the cases before our American courts would easily prove that the courts in large measure have suffered from the "special scientist's fallacy," the fallacy, namely, of accepting the interpretation of a concept given by

the special science as an interpretation thoroughly comprehensive and capable of unmodified application to the concrete human situation.

In this case, as in the others, a more organic view is necessary. Justice is an economic concept as well as a legal. It has its roots in biology and psychology, in sociology and ethics, in education and religion. It is, therefore, not to be defined by legalists, but by philosophers. Obviously, to borrow from Plato, until our judges are philosophers—philosophers of law, not merely legal scientists—there can be little hope of an interpretation and administration of justice that shall be largely and humanly social.

II

The cases adduced will be sufficient to make clear the function of social philosophy. Social philosophy is the critique of social categories. The question now arises how social philosophy is to proceed most systematically and effectively in the pursuit of its peculiar task. The social categories lie all about us in haphazard disarray. One of the relevant criticisms passed upon sociology is that, for all its assumption of scientific spirit and procedure, its results are in large measure unorganized. Its concepts hang loosely together. One passes from an analysis of the mob spirit to a discussion of the social psychology of leisure, and from an elaboration of charitable methods to an analysis of the class structure of society. In the case of sociology, however, the material is so vast and so heterogeneous, all kinds of problems crowd so upon the investigator, that there is little blame to the science if it has not yet set its house in order. Again, the social sciences themselves (whether we regard them as component parts of sociology or as coordinate with it) hang together but loosely. One of the sharp modern criticisms of history, for example, is that it has severed itself quite to its own hurt from economics. A like criticism is passed upon economics, that it has severed itself from social history and ethics; while jurisprudence is accused of holding a position of magnificent separation from all the sciences. One is reminded of the mutual backbitings of the natural scientists. The biologist was warned by the chemist that he must pay more heed to chemical truth; the chemist by the physicist that chemistry must be more alive to physics. All of which is indication to the philosopher—metaphysical or social—that the *organization* of concepts, which is his desideratum, does not lie ready to hand, but is one which he must himself effect.

The first task of social philosophy, then, is to make an inventory of the master concepts employed by the social sciences and to arrange these in some manner of organic relationship. Such a preliminary

organization will, of course, be but tentative, since it is impossible to foretell what changes will be wrought by the process of philosophic inspection and interpretation. But it will serve to give a working view of the field to be covered.

The social sciences deal with those relations and activities which are the outcome of the fundamental social powers of human life. It is not difficult to see that all of these powers have their root in appetite, positive and negative. Appetite in its positive aspect is a seeking-after, a being-drawn-to certain objects and situations. In its negative aspect, it is aversion, disgust, a seeking-to-escape certain objects and situations. Primarily, to be sure, appetites are individual in their reference; but human life is so constituted that appetites "lap over" from individual to individual and so constitute a true social nexus. This will be obvious when we name the two elemental forms of appetite: (1) the appetite for food and shelter, and (2) the appetite for sex. The food- and shelter-getting activities bring the individual very quickly into relation with other individuals; while the sexual activities are in their very essence social.

It is obvious that social science is, in the first place, and fundamentally, concerned with the two great types of relationship that are the outgrowth of these primary appetites; namely, work and sex-life. The latter, then, are the initial master concepts of the social sciences. Out of them develops a vast and complex system of derivative concepts. Work, for example, involves the concept of utility, which in turn bespeaks the concept of end or purpose. Again, it implies such various concepts as skill, productiveness, abundance, scarcity, application, industry, self-control, and, in more social reference, exchange, distribution, fairness, cooperation, competition, price, market, money, interest, rent, etc. In one direction the concept of work opens out into the science of economics; in another, into ethics; and again, in a third direction, into technology and art. In its more elaborated forms, as we shall later see, it develops into government and religion.

The concept of sex-life likewise opens out variously; on the one hand into the life relations made possible by sex, on the other hand into the different qualities of character developed through sex-life. Thus sex-life involves such concepts as promiscuity, marriage, polygamy, monogamy, blood-relationship, illegitimacy, divorce, etc., and again such concepts as chastity, lust, licentiousness, marital affection, parental care, etc. The concept asks toll of and makes its specific contribution to the sciences pertinent to social relations,—biology (heredity, sex hygiene, etc.), economics (family support, division of labor, etc.), psychology (adolescence, abnormality, etc.), sociology (laws of family, etc.), and ethics (purity, parental obligation, etc.). Here, too, as in the case of work, the concept opens out into art, government, and religion.

Almost as fundamental as the nutritive and sex appetites—perhaps as fundamental—is that peculiar appetite for colors, sounds, etc., which, in its developed form, we call the esthetic sense. Primarily a form of individual enjoyment, it manifests itself more and more widely and intricately in outer forms, and so becomes a power of large social significance. In one sense the esthetic power is independent; in another sense it is intimately related to the other powers of human life. In its independence, it develops its own laws and standards; in its relation to other human interests, it subjects itself to laws and standards more comprehensive. Thus a conflict tends always to disclose itself between the special claims of beauty and the more organic claims of life. Esthetic enjoyment (the third master concept) develops, too, its elaborate system of derivative concepts which lend themselves both to organization and to inspection as to their wider significance,—harmony, discord, order, symmetry, balance, proportion, composition, "softness," "sweetness," "vigor," melody, etc.

To pass now to the fourth fundamental concept. Life in all its forms is orientative. "Adaptation" is, in increasing measure, discovery. In its developed form such discovery becomes systematized as knowledge. The processes of knowledge-seeking and knowledge-imparting become systematized as science and education. It is unnecessary to dilate upon the profound social importance of this fourth master concept, knowledge. It need simply be pointed out here that knowledge—both the seeking and the imparting—develops its system of concepts,—truth, error, science, faith, law, uniformity, chance, development, nurture, education, creation, vocation, culture, etc., which offer themselves in peculiar measure to critical inspection.

Neither work, nor sex-life, nor the life of esthetic enjoyment, nor knowledge-seeking and imparting, however, can proceed far in their development without some organization of the life relations other than instinctive. Thus the elaboration of the life of work and sex and beauty and knowledge involves the development of government. Hence the fifth master concept. This concept, like the others, yields its increasingly intricate body of subordinate concepts,—justice, law, politics, citizenship, rights, property, liberty, etc., which, on the one hand, develop into the specific sciences of politics and jurisprudence, and on the other hand call into service the mathematical and natural sciences and such allied social sciences as history, economics, sociology, ethics, etc.

There is still a sixth master concept not so easy to define, yet far-reaching in its social effects. In one sense it is nothing more than the concept of appetite itself; and yet it extends so far beyond appetite in its primitive form that it not only demands a recognition for itself as

an independent concept, but forms sciences and disciplines in its own behoof. Appetite is a seeking, a seeking to attain the yet unattained, to avoid what may be escaped. It has, therefore, in its very essence an element prophetic of ideality, of aspiration. In this sense the concept of appetite already is, in a sense, the concept of which we are now to speak.

Life is primarily an adaptation (and therefore an attending) to physical things. But as life develops, it learns increasingly to attend not only to physical things, but also to its own attitudes toward these things, to the quality of its own seeking, and avoidances. It learns, in short, to detect certain directions, principles, ends in the seekings and avoidances. As a result, after long growth in conscious life, it formulates its concept of a new object to be pursued, an immaterial, ideal object,—the good. Thus consciously it aspires; it looks to an ideal of life; and it develops sciences and disciplines in the service of the ideal. These sciences, however, from the outset are not independent sciences, but are avowedly directive of all the other sciences. They indicate to work, sex-life, esthetic enjoyment, knowledge, and government what, in principle, their ends should be, what fundamentally they are *for*. Thus the sixth master concept of social science is the fundamentally evaluative concept of the good, the concept primarily of ethics and religion.

Work, sex-life, esthetic enjoyment, knowledge, government, the good,—it is with these that the social sciences are essentially concerned. A social philosophy, then, properly begins as a philosophy of work, or, to adopt the more specific modern terminology, as a philosophy of economics. It is noteworthy that while philosophical speculations upon economic matters are taking place all about us, from socialist treatises and utopias to detailed discussions of the wider human bearing of trusts and tariffs and taxes, no systematic *philosophy of economics* has yet been attempted. One may safely predict, however, that just as the fermentation in religious thought brought forth its resultant philosophies of religion, so the widespread contemporary discussion of all aspects of the economic situation will bring forth its appropriate philosophies of economics. At any rate, social philosophy has as its primary task the elaboration of such a philosophy.[5]

Sex-life has not yet developed its specific science. Here, too, however, discussion is rife,—discussion, likewise, that is distinctly philosophical in its quality. A second task, then, of social philosophy will be the careful systematization of the now haphazard sex discussion and an organization of it into a philosophy of sex-life.

[5] An important step in this direction has been taken by the English economist, Mr. J. A. Hobson, in his recently published book, "Work and Wealth: A Human Valuation" (Macmillan).

The esthetic sense has had its expression in all manner of concrete forms. It has had, too, its philosophies. But it awaits to-day a philosophy consonant with the deeper psychological and physical insights of the modern age. Hence the third task of social philosophy will be the development of a philosophy of esthetics.

In the field of knowledge-seeking (science), philosophy has been particularly active. It has made vigorous and careful inspection of such concepts as truth, law, cause, etc., and has, therefore, in various directions developed its philosophies of science. Social philosophy will press these largely metaphysical and logical inquiries into the service of social understanding. It will also, however, be interested in the other, the educational, aspect of knowledge. Thus the social philosophy of knowledge will at once be a social philosophy of science and of education.

Government has indeed long since had its philosophies. Here it will be the new aspects of government—political, juridical, and more widely social—that will of necessity demand a new philosophy of government. And in this case, too, the social philosopher will find material already richly at hand. For while there has been developed no systematic modern philosophy of government, books and essays without number treat constantly of the wider reach of politics and law. It is noteworthy that in America the movement for a systematic development of a philosophy of law is already well begun.[6] For the social philosopher, then, there is a clear pointing to the next important task of developing a philosophy of government.

And finally, crowning and commanding all these, must come the philosophy of highest human values,—the philosophy of the good; in short, an ethics and religion adequate to the new insights of our modern age.

Such, tentatively, is the plan of work for the social philosopher of to-day. It is not difficult to see that he enters a region not wholly unexplored, for adventurous ones, singly and in groups, have long since been mapping and occupying its wilds and fastnesses. The need of the time now, however, is for a more careful occupation and for a cultivation more systematic and entire. It is to this large task of vital organization that the social philosopher of to-day is called.

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[6] See the General Introduction to the Modern Legal Philosophy Series. The Boston Book Company.

JUDGMENTS ON HANDWRITING SIMILARITY AND DIFFERENCE

HOLLINGWORTH in a recent article[1] on "Judgments of Similarity and Difference" has reviewed certain references to the general topic, and has, in particular, emphasized two points of criticism: (1) the assumption that categories logically opposite are necessarily psychological opposites; and (2) the statement that in certain instances a judgment of unlikeness is more easily passed than a judgment of likeness. Hollingworth would prove that "a judgment of unlikeness is not merely the reverse of a judgment of likeness, but a new kind of judgment," by exhibiting for a given group of reagents a higher coefficient of correlation for two arrangements of handwriting specimens on the basis of their resemblance to a given model than is found when a resemblance arrangement is correlated with an inverted order for difference. He would prove his second point, the greater ease of the likeness judgment, by showing an average higher correlation between two such arrangements for a number of reagents than that found for two difference arrangements.

First, a few words relative to the general merits of the question. Hollingworth is, of course, right in challenging the uncritical assumption of Downey[2] that when handwriting samples are arranged in the order of similarity to a standard the judgments become toward the close of the series judgments of dissimilarity. He asserts, "The 'least similar' is not therefore the 'most unlike,'" a statement which his experiments are thought to prove. The evidence[3] upon which the statement under criticism was based was (1) the much greater constancy of certain reagents toward the end of the scale than at the beginning, and (2) the procedure of certain reagents in utilizing as they arranged their samples a method of elimination of—which? The "most unlike" or the "least similar"? The instructions were definitely given to arrange the specimens in the order of their likeness to a given standard. The inverse method of procedure points to an interesting problem, some quality—"least likeness"?—seems to have been more insistent than "most likeness." If there is evidence for Hollingworth's assertion that a positive category is more easily utilized than a negative one, there may be justification for assuming that towards the close of an arrangement the criterion "least like" would be converted into the "most unlike," for surely the latter terms represent the more positive category of the two. In the absence of facts

[1] *Psychological Review*, Vol. XX., pages 271–289.

[2] *Loc. cit.*, page 273.

[3] Downey, J. E., "Preliminary Study of Family Resemblance in Handwriting," *Bull. No. 1, Dept. of Psychol., Univ. of Wyoming.*

a quibble over words is, however, of little value. Hollingworth's resort to experiment is the proper thing. Apart from experiment one would have no justification in asserting the psychological identity of any two categories. Furthermore, we have ample evidence that any difference in instruction operates to induce some difference in the mental set of reagents.

Again, Hollingworth questions the inference that difference is more easily seen than likeness. Here also he criticizes Downey, who, on account of the lower average variability toward the close of the scale in the placing of handwriting specimens in the order of their resemblance to a certain standard, had concluded that for the *material utilized in the test* difference was *on the average* more easily seen than likeness. A more accurate statement would have been that a group of given reagents agreed more closely upon the specimens least like than upon the specimens most like a given sample, and that many individual reagents were more constant toward the close of the scale than at the beginning. The interpretation of such difference in variability at different points in the scale is at yet unsettled.[4]

Because of the individual differences in the method of procedure, as well as individual differences in the positions where repeated arrangements showed least variability, it seemed to the writer of the report under criticism that, possibly, the results pointed to an individual variation of some significance; that, possibly, some reagents concentrated spontaneously on difference, others on likeness.

Hollingworth in reviewing several opinions as to the relative ease with which likeness or difference is perceived seems to assume that either the one or the other category must be that which, apart from specific training, is the more easily applied. A third point of view is possible; ease with which difference or likeness is perceived may be a matter of individual organization.

It would not be difficult to find in literature statements of such a belief. To quote one only. Bacon writes, "There is one principal and as it were radical distinction between different minds, in respect

[4] Hollingworth in discussing this point ("Experimental Studies in Judgment," Archives of Psychology, No. 29, page 102) writes: "In fact one might expect the difficulty to increase regularly toward one end of the series, unless the material were deliberately chosen so as to afford items on both sides of the zero-point of the quality being judged." I am inclined to think that in such arrangements as those based on resemblance in handwriting, just the thing suggested occurs, that is, certain reagents in order to diminish the strain on attention shift after some neutral point to the antithetic category. They have difficulty in understanding their error in technique even when it is explained to them. In my series of judgments on poetry where the arrangement passed, by instructions, from pleasantness to unpleasantness through a neutral point, a lower variability at the lower end of the scale than in the middle occurred. ("The Imaginal Reaction to Poetry," *Bull. No. 2, Dept. of Psychol., Univ. of Wyoming.*)

of philosophy and the sciences; which is this: that some minds are stronger and apter to mark the differences of things, others to mark their resemblances. The steady and acute mind can fix its contemplations and dwell and fasten on the subtlest distinctions: the lofty and discursive mind recognizes and puts together the finest and most general resemblances. Both kinds, however, easily err in excess, by catching the one at gradations, the other at shadows."[5] It is this aphorism closely following the one cited by Hollingworth which leads me to conclude that Bacon would not have sanctioned the substitution in it of "similarities" for "affirmatives" nor of "differences" for "negatives."

Can one doubt that difference may be as positive a quality as likeness? In any case the material upon which judgment is passed must be very influential in determining the relative facility with which the categories are applied, as Hollingworth recognizes in his explanation of Dearborn's report of greater ease in dissimilarity choices. In order to put the question to a test, judgments of similarity and dissimilarity must, of course, be passed on the same material, but if slight variation in the material introduces a shift in the relative ease of the two forms of judgment, there is little evidence of any practical distinction as to the facility with which they are applied.

In order to test the matter further I adopted provisionally the conclusion that relative ease in the perception of handwriting similarity or difference is a matter of individual organization, and that a repetition of Hollingworth's experiment might *with selected subjects* bring somewhat different results. Accordingly, reagents to be utilized in such an experiment were chosen on the basis of the experimenter's observation of their mode of reaction and their accuracy in a test on matching pairs of handwriting.[6]

Twelve reagents were selected. For perception of similarity there were chosen, first, three very rapid and accurate reagents in the pairing of hands, namely, Mfr., Eda., and Jan.; and, secondly, three subjects who reacted very quickly and, apparently, in impressionistic manner, namely, Ado., Awi., and Msm. Ado. and Msm., less accurate in their pairings than the first three reagents, made, however, only errors of exchange, a kind of error that appears to indicate a very general perception of similarity. Msm. and Awi. found it very much easier to pair addresses than to pair single words, a result that seemed also to point to an impressionistic reaction. For perception of difference six reagents were chosen as follows: Fmc. and Ssh., who showed extraordinary preoccupation with details; Tfo., who was accurate in her pairings, but reacted with excessive slowness and

[5] Nov. Org., Bk. I., LV.

[6] A report on this experiment will appear elsewhere.

caution; Gab., who, very unsuccessful in finding matches, proceeded very definitely by a process of elimination of the specimens that *did not match;* Lth. and Meb., who were both slow and inaccurate. Of these twelve reagents, six were men, six women; all were seniors or juniors in college. Only one, Jan., was aware of the purpose of the experiment.

It was, of course, recognized that selection of reagents on such slight observation was precarious, even granting the truth of the assumption that the tendency to maintain a likeness or difference set is an individual variant of some significance. The interpretation of the varying reactions is open to question. Logically, it would seem that success in pairing hands might result from ease in the perception of difference as readily as from perception of likeness, so that the choice of rapid and accurate reagents as those concentrating on likeness might well be subject to error. Furthermore, while an impressionistic method of reaction might possibly stand in opposition to a preoccupation with details, both might be open to an interpretation as a perception of either likeness or difference. The choice of slow and inaccurate subjects as those relying upon perception of difference also seemed questionable. The experimenter felt most confidence in the selection of Msm., Awi., and Ado. for perception of likeness; and of Gab., Ssh., and Fmc. for perception of difference.

The experiment was carried out according to Hollingworth's instructions except that no reagents were tested in the mixed order, an order which, according to Hollingworth's interpretation of his records, gives less clear-cut results than when the similarity and difference judgments are kept separate.

Two series of tests were tried. In the first series the material consisted of thirty-six specimens of handwriting, the address of the experimenter, five words cut out and pasted upon uniform cards. More than half of these samples were written by persons of various degrees of kinship. A duplicate of one of the hands was used as standard. There were two groups of six reagents each. In each group were placed three of the reagents chosen for perception of likeness and three of those chosen for perception of difference. The first group (similarity first) arranged the cards twice in the order of resemblance to the standard at week-intervals, and after that, also at week-intervals, arranged the cards twice in the order of difference from the standard. The second group (difference first) made the first two arrangements on the basis of difference from the standard and the last two on the basis of resemblance. The instructions (quoted from Hollingworth)[7] were typed and placed before each reagent during the test. For resemblance they read as follows:

[7] *Loc. cit.*, page 277.

"Arrange the specimens of handwriting in an order of *resemblance to the standard.* Place the most similar specimens at the top, the *next most similar* in the second place, and the *least similar* at the bottom, with the remaining cards in their appropriate intermediate positions." For the difference arrangements the instructions read: "Arrange the specimens of handwriting in an order of *difference from* or *unlikeness* to the standard. Place at the top the card most different, the *next most different* in the second place, and the *least different* at the bottom, with the remaining cards in their appropriate intermediate positions."

In the second series, sixteen specimens of writing, the address of the experimenter, the same instructions were used. An attempt was made in this case to test the effect of material on the judgment. The test on the pairing of hands had shown that sample 15 of the duplicate series resembled a number of other hands in the first series, but that sample 6 was highly individualistic. Accordingly, six of the chosen reagents made four arrangements each of the sixteen samples as described above, three similarity first, three difference first with duplicate 15 as standard; and the six other reagents did the same with duplicate 6 as a standard. In each group were three reagents chosen for perception of likeness; three chosen for perception of difference.

It has been said that, in general, week-intervals separated each two groupings. The following irregularities occurred. For Ado. two weeks intervened between the first and second and between the third and fourth arrangements; for Eda. two weeks intervened between the first and second arrangements; for Lth. two weeks intervened between the first and second arrangement and ten days between the third and fourth. Two weeks intervened between Awi.'s second and third arrangement.

The coefficients of correlation were calculated by the formula

$$r = 1 - \frac{6\Sigma d^2}{n(n^2-1)}.$$

Table I. gives the positive coefficients of correlation for each two arrangements of the thirty-six cards by each of the twelve reagents. The results are presented in two groups in accordance with the experimenter's anticipations. Hollingworth's abbreviations are adopted in order to make comparison of our results with his an easy matter. S1 and D1 refer to the first trial for similarity and difference respectively; S2 and D2 to the second trials. The inverted order of difference was used for the correlation between the similarity and difference arrangement. In Table II. the results from the shorter series are tabulated.

We may survey the tables with the following questions in mind: (1) To what extent were the anticipations of the experimenter confirmed and the relative ease of perception of likeness and difference shown to be a matter of individual variation? (2) What evidence is there that the similarity judgment is more easily given than the difference judgment? Do more reagents give a higher correlation for the similarity arrangements? Or is the average correlation of the similarity arrangements higher than the average for the difference arrangements?

First, an attempt to answer these questions on the face of the returns, although, as will appear later, my own interpretation of the results gives such weight to practise effects as to make any answer to these questions on the basis of the present data very uncertain.

With reference to the first question it is evident that in the longer series the experimenter's anticipations were confirmed only five out of twelve times; in the shorter series eight out of twelve times. Selection might, then, have been made nearly as well at random, assuming that in a random selection we are as apt to strike a preoccupation with difference as one with likeness. Of the present reagents, Msm. and Jan. were well selected for perception of likeness; Meb., Gab., and Fmc. for perception of difference. The experimenter's confident selections were confirmed only in the case of Msm., Gab., and Fmc.

TABLE I

36 CARDS

Correlations between the Various Arrangements by the same Reagent

Chosen for Similarity Judgment						Chosen for Difference Judgment					
Reagent	*S*1 with *S*2	*D*1 with *D*2	*S*1 with *D*1	*S*2 with *D*2	*S*2 with *D*1	Reagent	*S*1 with *S*2	*D*1 with *D*2	*S*1 with *D*1	*S*2 with *D*2	*S*2 with *D*1
Msm., *S* 1st...	.818	.460	.454	.675	.455	Gab., *S* 1st....	.634	.773	.690	.708	.828
Eda., *S* 1st....	.740	.884	.645	.747	.764	Meb., *S* 1st ...	.582	.848	.606	.806	.743
Ado., *S* 1st....	.665	.716	.608	.661	.630	Lth., *S* 1st	.701	.689	.656	.706	.779
Jan., *D* 1st....	.881	.842	.777	.838	.785	Fmc., *D* 1st...	.687	.702	.653	.514	.511
Mfr., *D* 1st....	.657	.731	.615	.806	.706	Tfo., *D* 1st....	.790	.692	.586	.626	.541
Awi., *D* 1st ...	.666	.677	.687	.772	.790	Ssh., *D* 1st....	.877	.629	.718	.780	.647
Average.....	.737	.718	.636	.749	.688	Average.....	.711	.722	.653	.690	.674
Mean variation.....	.075	.10	.067	.055	.097	Mean variation.....	.081	.056	.038	.080	.108

It is true that if we consider the average coefficients for the two groups of reagents (longer series) we find that the group chosen for judgment of similarity gave a higher correlation for similarity than for difference, and the group chosen for difference gave a higher correlation for difference than for likeness. The difference between the averages is, however, so very slight and so obviously determined

TABLE II

16 CARDS

Correlations between the Various Arrangements by the same Reagent

Standard 15					Standard 6				
Reagents	*S*1 with *S*2	*D*1 with *D*2	*S*1 with *D*1	*S*2 with *D*2	Reagents	*S*1 with *S*2	*D*1 with *D*2	*S*1 with *D*1	*S*2 with *D*2
Msm., *S* 1st	.858	.847	.767	.860	Ado., *S* 1st	.788	.900	.782	.761
Eda., *S* 1st	.805	.950	.770	.868	Lth., *S* 1st	.514	.735	.773	.720
Gab., *S* 1st	.591	.805	.758	.688	Meb., *S* 1st	.535	.667	.658	.658
Jan., *D* 1st	.935	.702	.782	.732	Awi., *D* 1st	.685	.947	.914	.879
Fmc., *D* 1st	.929	.941	.929	.814	Tfo., *D* 1st	.937	.791	.902	.914
Ssh., *D* 1st	.847	.921	.802	.884	Mfr., *D* 1st	.905	.658	.544	.914
Average	.827	.861	.801	.807	Average	.727	.783	.762	.807
Mean variation	.086	.076	.042	.065	Mean variation	.149	.096	.107	.094

by the reactions of one or two reagents that these averages have little significance.

With reference to the second question, we find that seven out of the twelve reagents, longer series (eight in the shorter series), gave a higher correlation between the two difference arrangements than between the two arrangements for similarity, a preponderance in the direction opposite to that found by Hollingworth. The difference is pronounced in only five cases, and of these, three are in favor of the difference correlation, two in favor of the similarity correlation. The average of coefficients was for likeness .724 and for unlikeness .720, too slight a difference to justify any interpretation.

My study of the figures and my observation of the reactions of the subjects convinced me that the practise effect growing out of familiarity with the material gave such an advantage to whichever grouping was made second as to introduce great uncertainty in the interpretation of results. Only in those cases, it seemed, where the second pair of arrangements gave a lower coefficient of correlation than the first was there evidence of individual variation in the ease with which the categories could be applied. There were only four cases in which the first two arrangements gave a higher correlation than the second two. Msm.'s record shows, apparently, a great preoccupation with similarity; we may conclude that Mfr. and Fmc. are, to a less degree, predisposed to see difference and Lth. to see likeness.

It is, of course, impossible to determine how much influence practise effect may have had upon the figures. In the eight cases (longer series) where the last two arrangements gave a higher correlation than the first two, the increase ranges from .039 to .279. The practise effect for different reagents might well have varied if we

may judge at all by the amount of time required for the work. This time in the case of every arrangement was kept by a stop-watch. Meb., who spent most time in making the four arrangements, something over two hours, showed the greatest difference between the two pairs of arrangements in favor of the second, .279. Ssh. spent the next longest time and shows the next highest increase in favor of the second, .248. Jan. and Ado. spent, respectively, only twenty-one and twenty-eight minutes on the whole four arrangements, and gave an increased correlation amounting to only .039 and .051.

A practise effect was apparent not only in a tendency for the third and fourth arrangements to correlate more closely than the first and second, but also in a reduction of the time needed for making the later arrangements. It took Ssh., for instance, thirty minutes to make the first arrangement and thirteen minutes to make the fourth. Except for the very quick reagents (Eda., Ado., Jan.) there is continuous decrease in time for the successive arrangements. General habituation in handling such material is shown, further, by the results of a second test on pairing of hands tried at the close of this experiment on the judgment of similarity and difference; there is great increase in speed and accuracy on the part of certain reagents. The practise effect was particularly evident for Ssh., Gab., and Lth., the first two being particularly painstaking in their arrangements for similarity and difference and showing great increase in the correlation of the third and fourth arrangements.

Let us consider also how far the judgments of similarity and difference seem to represent two distinct mental sets as shown by the correlation between reciprocal arrangements. For one reagent, Awi., the reciprocal correlations are all higher than the direct correlations (long series) and, as his introspections indicate, this subject had very great difficulty in maintaining any distinct set. For other reagents there are cases where the correlation between reciprocal arrangements is higher than that between one or the other of the direct arrangements. There are examples of some very high reciprocal correlations.

The correlation of the reciprocal of the second difference arrangement with the second likeness arrangement is higher than the correlation of the reciprocal of the first difference arrangement with the first likeness arrangement. Hollingworth also found this to be true and accounts for it by the approximation of the two categories "with repetition, adaptation, and familiarity with the material."[8]

Self-consistency certainly increases as the reagent grows more familiar with the material and better adapted to the conditions of the test, but such increasing self-consistency may *raise the second*

[8] *Loc. cit.*, page 288.

direct correlation as well as the correlation between a direct arrangement and the reciprocal of the inverse arrangement. The effect of practise is not confined to bringing together the opposite categories—an assertion which needs explanation if the opposite categories represent diverse psychological operations,—but is evident also in the ease with which the reagent handles the whole situation. The practise effect must be kept in mind if we would determine the bearing of the results of any such test as the present upon the problems under consideration.

Our general conclusions are as follows: First, the method utilized by Hollingworth requires certain modifications in order to justify the drawing of any conclusions. A long time-interval should intervene between the two arrangements for likeness and the two arrangements for difference in order to minimize the practise effect. Moreover, the object of the test should be carefully explained to each reagent in order to insure his keeping very definitely in mind the mental set required. The introspections of the present subjects indicate considerable difficulty in discriminating between the "least like" and "most unlike." Careful explanation of the purpose of the test would have put them on guard.

Secondly, the outcome of the present test does not indicate that the likeness judgment is given with greater ease than the difference judgment; a greater number of reagents were more self-consistent in giving the latter. The introspective reports assert, also, the relative greater ease of the likeness judgment less frequently than did Hollingworth's subjects. Msm., Tfo., Awi., Ssh., and Jan. report that the similarity arrangement was the easier to make. Lth. and Mfr. found no difference in the ease of the two. Ado. and Meb. asserted that they had more confidence in the difference arrangement, although Meb. adds, "The practise effect of repeated arrangements may have something to do with this feeling." Fmc. found the difference arrangement the easier to give, but was inclined to ascribe this increased ease to practise rather than to purpose or method. So, too, Gab. reported of the difference arrangement, "No easier than the preceding arrangement except so far as familiarity is concerned."

Thirdly, there is some indication of a psychological difference in mental set for logically opposite categories for *certain reagents* and a tendency toward definite preoccupation with likeness or difference. Ado., Jan., and Tfo., the reagents of the most psychological training, speak of distinct sets for the different judgments and were alert to inhibit the wrong one. Ado. and Jan. report sudden peculiar shifts at times from one attitude to another. It required considerable effort of attention to inhibit a shift to the opposite set when ease in manipulation seemed to justify such a shift.

A further bit of evidence as to the difference between a similarity and dissimilarity set occurs in the correlation found between a ranking for self-consistency in giving the likeness judgment and the accuracy with which hands could be paired. The ranking for consistency in giving the likeness judgment is subject to error in that six of the reagents made the two arrangements for likeness before the two for difference, while the six other reagents made the similarity arrangements second. This latter group had the practise advantage. The coefficient of correlation is probably reduced; it amounts to .515 for a first test of pairing handwritings, and .565 for a second test on pairing hands. A ranking for consistency in giving the difference judgment and accuracy in pairing of hands shows no correlation; .02 for the first test in pairing, and —.281 for the second test.

The relation of ease of judgment to material has already been mentioned. To test this specifically the shorter series of samples of writing was used. Two standards were employed, sample 15, a conventional hand, and sample 6, a highly individualized hand. With both standards the average correlation for the difference arrangements is higher than that for the likeness arrangements, but the relative increase in favor of the difference correlation is slightly higher in favor of the individualized writing. On the whole, however, the correlations are much higher for standard 15. Is this due to the choice of the standard or to the chance grouping of subjects? The group arranging the samples with reference to standard 15 had perhaps slightly the advantage with respect to subjects. Mostly, however, the situation seems to be operative in determining the results. The situation also operates, in the case of certain reagents (Ssh., Lth., Mfr.), in causing a shift in the kind of judgment showing the greater consistency. Obviously, the material utilized has so much to do with the outcome that it is desirable to evaluate it in some way.

In any case the problem of the perception of likeness and difference is so important that we should welcome any attempt such as Hollingworth's to break ground.

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REVIEWS AND ABSTRACTS OF LITERATURE

Il Metodo degli Equivalenti. AGOSTINO GEMELLI. Florence: Libreria Editrice Fiorentina. 1914. Pp. 344.

"It is a little surprising that the method of equivalents has not made more impression upon the practise and literature of experimental psychology. . . . The reason for its neglect is, in all probability, the fact that it has no direct bearing upon Weber's Law." This is Titchener's

comment on the history of the method of equivalents. Besides the fact that this method does not give a measure of sensitivity, at least two more reasons may be advanced for its fate. The result of a determination by this method usually is expressed in the form of the ratio of the value of subjective equality to the objective value of the standard stimulus. The inventors of this method expected that this ratio would be fairly constant and not depend on the intensity of the standard, but this hope was not realized. To this must be added the theoretical difficulty to define the result of the method of equivalents in the terms of the method of constant stimuli. The method of constant stimuli certainly is the simplest of all psychophysical methods, and there is a general tendency among the investigators of to-day not to consider a procedure of experimentation and calculation as well understood so long as its relation to the method of constant stimuli is unexplained. This seems to be particularly hopeless in the present case, for while the method of equivalents gives the subjective equivalent, but no measure of sensitivity, the latter procedure gives a measure of sensitivity, but no value of subjective equality. Not until recent years has the problem been attacked to define the point of subjective equality in terms of the method of constant stimuli.

Gemelli undertakes an experimental investigation of the first point. Using an esthesiometer of his own invention, he determines by the procedure of minimal variations in the methods of equivalents the subjective equivalents of cutaneous distances presented on the forehead, the chest, the forearm, and the back. The standard distances varied from threshold values to 12 cm. The ratios of the subjective equivalents to the objective values of the standards set in with very high values and decrease with increasing standard. For standards of about 8 cm. this ratio is smallest, and from this point on they increase again. Some of the values found by Gemelli are almost as high as those obtained by Miss Washburn, but it seems that this agreement is closest for very large and very small standards. The value of this ratio also depends on the sensitivity of the parts of the skin to which the stimulus is applied, and it is the larger the greater the difference in sensitivity of the two points stimulated. This indicates that this ratio increases with the difficulties the subject encounters in comparing the two distances.

The next point investigated is the influence of the pressure exerted by the points of the esthesiometer, which was constructed in such a way as to control the pressure. It is found that a higher pressure increases the sensitivity, since the greater the sensitivity, the more the ratio approaches unity. The ratio of the subjective equivalents to the objective value of the standards differs less from unity, as the pressure is increased. This result is in agreement with the observations of Miss Cook and v. Frey.

One of the most interesting problems which lends itself to an investigation by the method of equivalents is the influence of optical images on our estimation of cutaneous distances. Gemelli tries to analyze this by determining the equivalents of distances given on the forehead and on the arm, and on the chest and on the arm. In one group of experiments the arm was kept stretched out along the body, while in the other

group it was abducted as far as possible. The distance on the arm in the distal position is underestimated compared with the impression which is received when in its normal position. In other words, when a part of our body is removed from the median line, distances on this member are underestimated. Gemelli believes that this underestimation is due to the influence of optical images, and tries to prove this assertion by a series of similar experiments on two blind subjects who show no such underestimation. Without going into the details of this subtle argument we like to remark that it is not quite on the level of the investigations in which the subject is asked in one group of experiments to produce these images as vividly as possible, while in another group he is asked to suppress them. This is a typical case of psychological experimentation, in which systematic use is made of introspection, while Gemelli's method is not quite so decisive and rather reminds one of behaviorist investigations.

The third part of the book, in which an introspective analysis of the process of comparison of cutaneous distances is given, is of particular interest. The process by which the subject arrives at a judgment as to the relative size of the standard and comparison lengths is regarded as a thought process, and the customary methods for its analysis are applied. This is a step in the right direction, for psychophysics is just as much in need of a qualitative analysis of the process of comparison as of an exact understanding of the methods for evaluating the results obtained. Gemelli's merit on this point is undisputed, although his originality is not quite as great as he believes. Several authors before him have emphasized the necessity of an introspective analysis of the process by which we arrive at a judgment about the relation of the stimuli presented.

The experiments reported in this book were made under the direction of Külpe and Kiesow and one can easily see the influence of their ideas. The results are given in great detail and always convey the impression of careful and conscientious work. There is no doubt that the author has advanced our knowledge materially on several points, and nothing of what shall be said is intended to retract anything from this praise. The book has the appearance of a German "Habilitationsschrift," of which it shares the good and bad points. The references are very numerous—so numerous, in fact, that one sometimes gets the impression that the purpose of the quotations is not so much to impart information to the reader as to show off the erudition of the writer. It is hardly possible that Gemelli really mastered all the publications he cites, and as a matter of fact one may doubt whether anybody in his place could have done so, since the literature on the method of equivalents is not yet properly worked over. Some of the references are incorrect. I was slightly chagrined to discover that in Italy one of the publications of which I have the weakness to regard myself as the author is attributed to one of the psychophysical Browns—Warner Brown, presumably. On the other hand, a paper is credited to me of which I have a rather superficial knowledge only. Mistakes of this kind are almost unavoidable, if the references are as numerous as in Gemelli's book.

A fundamental shortcoming of the book lies in the very formulation of the problem: Gemelli does not analyze the formal character of the method. This is due to the fact that he is not acquainted with the recent investigations on the value of subjective equality and on the method of just perceptible differences. This is peculiar, since he quotes some of my papers as well as Wirth's book, in which a long chapter is devoted to the exposition of these ideas. The first important point in an analysis of this method is to lay down a definition of the subjective equivalent in terms of the probabilities of the different judgments. The next point is the analysis of what Gemelli calls the procedure of minimal variations in the method of equivalents. This does not offer any great difficulties, since the formulæ for the method of just perceptible differences could be easily adapted so as to fit this case.

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Das Wissen der Gegenwart in Mathematik und Naturwissenschaft. Wissenschaft und Hypothese, XVI. E. PICARD. Leipzig: B. G. Teubner. 1913. Pp. 292.

"Das Wissen der Gegenwart" gives a concise and valuable history of the development of mathematics and natural science in recent years, and is concerned not only with mathematics and natural science, but also with the relation between the two. Each science has its "pre-mathematical period." For example, biology has not yet reached a point where its laws may be expressed in mathematical form, while physics is farther advanced toward such a point. And yet, as Fresnel said to Laplace, "Nature does not bother herself about analytic difficulties," so it often happens that a natural law may be expressed in mathematical form only with the greatest difficulty, and, once formulated, may need to be revised and extended.

The scientist does not object to this, but rather rejoices in it, since he regards science as growing and would have no interest in it otherwise. He aims to find a "theory" which will first order and explain known phenomena, and will then prove "fruitful" in bringing about the discovery of new phenomena. If these, in their turn, require a revision of his theory, so much the better. According to Picard's view, scientists differ essentially from two other classes of men—from certain philosophers, who aim at a fixed set of laws to explain all phenomena that are to come and who are apt to be dogmatic, fitting facts to theories; and from those who have interest only in things commercial, not realizing that "the scientific dreamers who seem buried in their theories are really men of affairs." Experiment suggests theory and theory experiment, and each is dependent on the other. But the value of a theoretical investigation is not always recognized at once; for example, "the researches of Gibbs remained for fifteen years almost wholly unknown, until one day van der Waals acquainted the Dutch chemists with their importance;" and the careful study of conic sections by the Greek geometers remained "useless" for two thousand years.

The present tendency to break down the walls between sciences presents the problem of extending the laws of physics so as to apply to phenomena in chemistry and biology. The field thus opened demands of the scholar knowledge so extensive that in future the most important results will be reached through the combined efforts of scientists in different fields, say, a physicist or chemist working with a mathematician.

Mathematical concepts (function, infinity, the continuum, etc.) are clearly brought out in their historical setting. Classing mathematicians as physicists or logicians, Picard is a physicist. "True rigor," he says, "is fruitful, and differs from that other rigor—tiresome and purely formal—which only obscures the problems that it touches."

The author announces that his book will have nothing to do with philosophy "in the ordinary sense." A scientist in his laboratory is not concerned with doubts as to the existence of phenomena whose laws he is investigating; Galileo was the father of modern science because he asked not *why* but *how* bodies fall. But a student of philosophy in the broad sense will find the book full of interest. The author suggests, for example, that we owe the idea of cardinal number (number pertaining to a group) to our sense of sight, and the idea of ordinal number to our sense of hearing. And throughout the treatment of non-Euclidean geometries and the "new physics" it is evident that the author has a keen philosophical interest. In fact, his general attitude toward science is itself a philosophy. The notes by F. Lindemann are rich in references for further study.

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The Mental Capacity of the American Negro. MARION J. MAYO. New York: The Science Press. Pp. 70.

Marion J. Mayo has made a study of the class standing of 150 colored students in the high schools of New York during a space of about three years. From this study the author concludes, "that as regards the mental heredity of the Negro and white races as represented in our Northern States, the average mental ability of the white race, so far as this ability is exercised in school studies, is higher, but not a great deal higher, than that of the colored race; and that as regards the mental variability, the white race is more variable, but not a great deal more variable, than is the Negro race."

To base conclusions as to ten and one quarter millions people on a study of 150 would seem to be a little rash. It is, however, especially questionable when the measurements relied on are the class marks given in a public school system. Further than this, Miss Mayo had no means of knowing how "colored" these students were; that is whether they were seven-eighths white or seven-eighths black, whether they represent Bantu or Hottentot Negroes, Songhay or Pygmies. To assume then that these 150 pupils represent a "race" was going far beyond the evidence.

The author says, that, "if we admit that white pupils on the whole surpass colored pupils in school ability, we may well ask whether this is

due to causes that are accidental, temporary, and removable, or to causes that are fundamental and ineradicable. In other words, is this difference a matter of opportunity, or of heredity?"

The answer is not certain, the author admits, but concludes that the main factor is to be found in "race heredity," because "everything in the power of educator, philanthropist, and lawgiver has been done for the equalization of opportunity."

It will occur to every person who knows anything about the race problem in America that this is a monstrous conclusion. As a matter of fact the colored children in the high schools of New York suffer:

1. From poor training in southern schools, whence the majority of them come;

2. From the necessity of working their way through school, thus having little time for study or recreation;

3. From home surroundings, which do not encourage study and do not afford the kind of help which high-school home study calls for;

4. From a lack of that general social contact out of which the ordinary white boy in the big city gets so much of his education.

Other groups of students of all races suffer to some extent from similar difficulties, but it can easily be proven that the colored student suffers a little more from the causes enumerated. Is it not then reasonable to assume that lack of opportunity rather than "race heredity" fully accounts for the comparatively small differences which the author finds?

Beyond this, the reader of a study like Miss Mayo's feels impelled to criticize the underlying method. The material relied upon is so small and so questionable that no author would dare to use it for any conclusion except one of which the public approves.

Suppose, for instance, that the native-born American in this study had been compared with Russian Jews in the high schools, or that persons of Irish descent had been compared with Germans. Before any author would have dared to come to conclusions he would have built up a body of facts extending over long periods. Undoubtedly, the statistical method is going to be used in psychology more and more in the future, but it is going to call for a system of enumeration and a weighing of probable evidence and a definition of terms of which this author shows no adequate conception.

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New York City.

JOURNALS AND NEW BOOKS.

RIVISTA DI FILOSOFIA NEO-SCOLASTICA. June, 1914. *Il problema criteriologico o il problema ontologico?* (pp. 189–195): A. Cuschieri. – The so-called problem of criteriology is nothing but the old problem of universals in a new form; and it is time to do away with this old-new question, of which nobody has yet been able to determine the nature and the limits. *Francesco Suarez. In margine della storia della filosofia* (pp. 196–218): M. Brusadelli. – An analysis of Scoraille's recent

work, "François Suarez, de la Compagnie de Jésus." *La Filosofia di Benedetto Croce* (pp. 219–239): E. CHIOCCHETTI. – Croce's philosophy is a modified Hegelianism, in which the Hegelian principles of becoming and of the identity of the real with the rational are corrected. *Compiti e metodi della moderna psicologia della religione* (pp. 240–255): G. WUNDERLE. – The psychology of religion furnishes material to the philosophy of religion and to theology, and opens to pedagogy the most direct way to reach the human heart. *Note e discussioni. Analisi d' opere.* R. Bizzarri, *Studi sull' Estetica:* C. OLIVIERI. P. Stoppani, *La concezione della materia secondo A. Rosmini:* E. CHIOCCHETTI. G. Mattiussi, *Il Veleno kantiano:* F. OLGIATI. G. Saitta, *La personalità di Dio e la filosofia dell' immanenza:* F. OLGIATI. G. Chiarella, *Problemi odierni:* A. QUEIROLO. P. Carus, *Il buddismo e i suoi critici cristiani:* R. FUSARI. M. Horten, *Die speculative und positive Theologie des Islam nach Razi und ihre Kritik durch Tusi:* L. BIANCHI. *Notiziario.*

REVUE DE METAPHYSIQUE ET DE MORALE. May, 1914. *La Morale de Rauh* (pp. 293–333): D. ROUSTAN. – Rauh's tenets often show a striking similarity to those of the Chicago school. His theory of moral experience emphasizes the inventive and creative character of moral activity. Moral belief may be said to be successful when, after impartial trial, it is strengthened as faith. *La Nature des Lois Biologiques* (pp. 334–360): M. CAULLERY. – The vitalists' error is mainly due to their exclusively considering the relatively small number of organisms and functions which have proved successful in the course of evolution. Mechanism is able to explain all the biological processes in function of the elementary properties of protoplasm, although it is as yet unable to explain the latter. But vitalism, which implies indeterminism, is still less equal to the task. *Philosophie et Mythe* (pp. 361–381): E. BRÉHIER. – A process akin to day-dreaming, mythic thought strives to conceive a universe in which human action is real and significant. Essentially a historical view of things, it always accompanies and supplements purely static speculation and is responsible for the present-day conception of immortality, destiny, progress, etc. *Études Critiques. Les Transformations du Droit au XIX^e Siècle* (concluded): E. LASKINE. *Questions Pratiques. Le Droit de l'Électeur:* CH. DUNAN. *Livres Nouveaux. Revues et Périodiques. Informations.*

Bailey, Margaret Lewis. Milton and Jakob Boehme. New York: Oxford University Press. American Branch. 1914. Pp. vii + 200.

Boll, Franz. Aus der Affenbarung Johannis. Leipzig und Berlin. Verlag von B. G. Teubner. 1914. Pp. viii + 151. 5 M.

Buffet, Edward P. The Layman Revato. New York: Douglas C. McMurtrie. 1914. Pp. vi + 106. $2.00.

Cohn, Jonas. Der Sinn der Gegenwärtigen Kultur. Leipzig: Verlag von Felix Meiner. 1914. Pp. xi + 297. 8 M.

Davies, Henry. Art in Education and Life. Columbus, Ohio: R. G. Adams and Company. 1914. Pp. xiii + 334.

NOTES AND NEWS

On August 26, the Philosophical Union of the University of California celebrated its twenty-fifth anniversary. The address of the occasion was delivered by Professor Josiah Royce on the subject "The Spirit of the Community." The Union was founded in 1889 by Professor George Holmes Howison, then Mills Professor of Philosophy in the University of California; and to his inspiration and guidance, the University and the Pacific Coast are chiefly indebted for that persistent cultivation of philosophic interests for which the Union has stood. The conviction expressed at its founding was that philosophical studies had a supreme interest for human life in all its aspects; and the members banded themselves together to increase philosophy's control over their own aims and conduct, to awaken its interest in others, and in particular to maintain at the seat of the University, a central association for philosophical study. The annual addresses have been notable features of the Union's life. Usually when the programme for the year's study was based upon some recent book, these addresses have been delivered by the author's themselves. The invitations to such men has given occasion for some of the important philosophical utterances of the time. Among the Union's published lectures may be mentioned "The Conception of God," Josiah Royce; "Christianity and Idealism,'" John Watson; "Philosophical Conceptions and Practical Results," William James; "Psychology and Philosophic Method," John Dewey; "The Heart of Ethics," G. H. Palmer; "Philosophical Orientation and Scientific Standpoints," James Ward; "The Relation of Time and Eternity," John Ellis McTaggart; and "The Genteel Tradition in American Philosophy," George Santayana. The annual lecture of last year, by Canon Hastings Rashdall, and Professor Royce's anniversary address remain to be published.

The Prussian Academy of Sciences has offered a prize of 5,000 marks for the best study of "Experience as a Factor in Perception." The articles may be in German, Latin, French, English, or Italian, and must reach the Academy by December 31, 1915.

Dr Robert M. Ogden, Secretary of the American Psychological Association, has resigned his position as professor of philosophy and psychology at the University of Tennessee to accept the professorship of psychology at the University of Kansas.

Dean A. Worcester, B.A. (Colorado, '11), has been appointed associate professor of psychology in the University of New Mexico.